

ABSTRACT OF THE DISCLOSURE

The invention is directed to a method and device for routing, mixing, or reacting
5 droplets or liquid microstreams along the surface of a flat substrate. The flow of liquid
microstreams or microdroplets along designated pathways is confined by chemical
surface patterning. Individually addressable heating elements, which are embedded in
the substrate, can be used to generate flow via thermocapillary effects or to trigger or
quench chemical reactions. The open architecture allows the liquid to remain in constant
10 contact with the ambient atmosphere. The device can be used for microfluidic
applications or as a surface reactor or biosensor, among other applications.